

Work Order ID 151152

Monday, September 12, 2016 10:45:34 AM

151152

Page 1

Item ID: D5311-1 Accept ***N900040100*** Setup Start ***NS1***
Revision ID: Stop ***NS2***
Item Name: Swivel Joint, Inner
Start Date: 9/13/2016 Start Qty: 12.00 ***12*** Cust Item ID:
Required Date: 9/13/2016 Req'd Qty: 12.00 ***12*** Customer:
Reference:

Approvals: Process Plan: DAS 21 Date: SEP 14 2016 Tooling: _____ Date: _____ Run Start ***NR1***
QC: 9-89 Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

Draw Nbr	Revision Nbr
D5311	B

110

110

Hardinge

Hardinge CNC Lathe Small

Hardinge CNC LATHE SMALL

Memo

1- Machine as per Folio FB
FOLIO REV: AA
DWG REV: B

2- Deburr

0.00

0.02

DAS
45
9-89

2016-9-28

120

120

QC

Quality Control

QC2- Inspect parts off machine FAI/FAIB

Memo

0.00

0.02

DAS
45
9-89

2016-9-28

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐			
Date : _____	Step #: _____	QTY Effective : _____		MRB (QSI042) Approval	
Description Work Order Deviation		Disposition			
				Completed By	
				Lead hand / Supervisor Approval Verification	
				QC / QA Coordinator Approval	
Root Cause Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐ No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐		FAULT CATEGORY Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐ Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Misabeled ☐ Fit/Function ☐ Misaligned/off center ☐ Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐			
OTHER : _____					

Monday, September 12, 2016 10:45:34 AM

Page 2

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
130	QC8- Inspect parts - second check	0.00							
130									
QC	Memo	0.04				12			216-9-26
Quality Control									
140	Identify as per dwg & Stock Location: _____	0.00							
140									
Packaging	Memo	0.02				12	DAS 6 9-89	SEP 29 2016	
Packaging	***WA1***								
150	QC21- Final Inspection - Work Order Release	0.00							
150									
QC	Memo	0.20					DAS 21 9-89	SEP 30 2016	
Quality Control									
							DAS 21 9-89	SEP 30 2016	

DQA: _____ Date: _____

**WORK ORDER NON-CONFORMANCE / UPDATE**

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval 		
Description Work Order Deviation				Disposition					
								Completed By	
				Lead hand / Supervisor Approval Verification					
				QC / QA Coordinator Approval					
Root Cause		FAULT CATEGORY							
Environment ☐	No Re-verification ☐	Pressure/Forced ☐	Temperature/Cure ☐	Power Loss/Surge ☐	Positioned Wrong ☐				
Design ☐	Operator ☐	Bending ☐	Set-up ☐	Folio/Program ☐	Outside Dimensions ☐				
Doc/Data ☐	Offset/Setup ☐	Centre Not Concentric ☐	BOM/Route ☐	Grain ☐	Over/Under tolerance ☐				
Equip/Tooling ☐	Supplier ☐	Cracks ☐	Broken/Damage/Defect ☐	Weld ☐	Part Incorrect ☐				
Handling/Pre ☐	Training ☐	Crimp/Kink/Ripple/Wave ☐	Inspection Incomplete/Unqualified ☐	Wrong Stock Pulled ☐	Part Lost/Missing ☐				
Material ☐	Use for Testing ☐	Cuffs ☐	Contamination ☐	Out of Sequence ☐	Part Moved ☐				
Internal Transport ☐	Poor Information ☐	Crushing ☐	Countersink ☐	Off-set ☐	Drawing ☐				
Tribal Knowledge ☐	Rushing ☐	Heat Treat ☐	Cut Too Short ☐	Mislabeled ☐	Finish ☐				
LOA ☐	Product Improvement ☐	Wave/Twist in Tube ☐	Instructions Incomplete/Unclear ☐	Fit/Function ☐	Misread ☐				
Substation ☐	Process Improvement ☐	Marks/Chatter ☐	Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐				
Past Expiry Date ☐	Manufacturing Process ☐	OTHER :							
Misidentified ☐	Past Due ☐								

Picklist Print

Monday, September 12, 2016 10:45:33 AM

Page 1

Work Order ID: 151152

151152

Parent Item: D5311-1

D5311-1

Parent Item Name: Swivel Joint, Inner

Start Date: 9/13/2016

Required Date: 9/13/2016

Start Qty: 12.00

Required Qty: 12.00

Comments: IIN REV:A 16.02.10 NEW ISSUE DD VERF:JLM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
M304RO.750		Purchased	No				f	26.1500		1.263158			

M304RO 750

304 SS Roundbar .750

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
MAT	24	
<u>M135512</u>	24	
MAT029	2.15	
135275	2.15	

1.33[±] DAS
45 2016-9-28
9-89

DQA: _____ Date: _____

WORK ORDER NON-CONFORMANCE / UPDATE



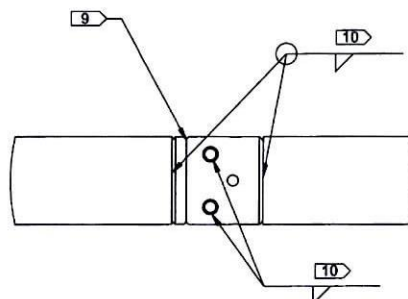
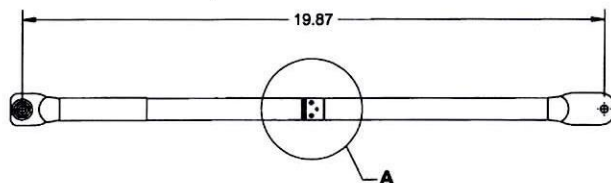
QA Closed: _____ Date: _____

Work Order update only ☐

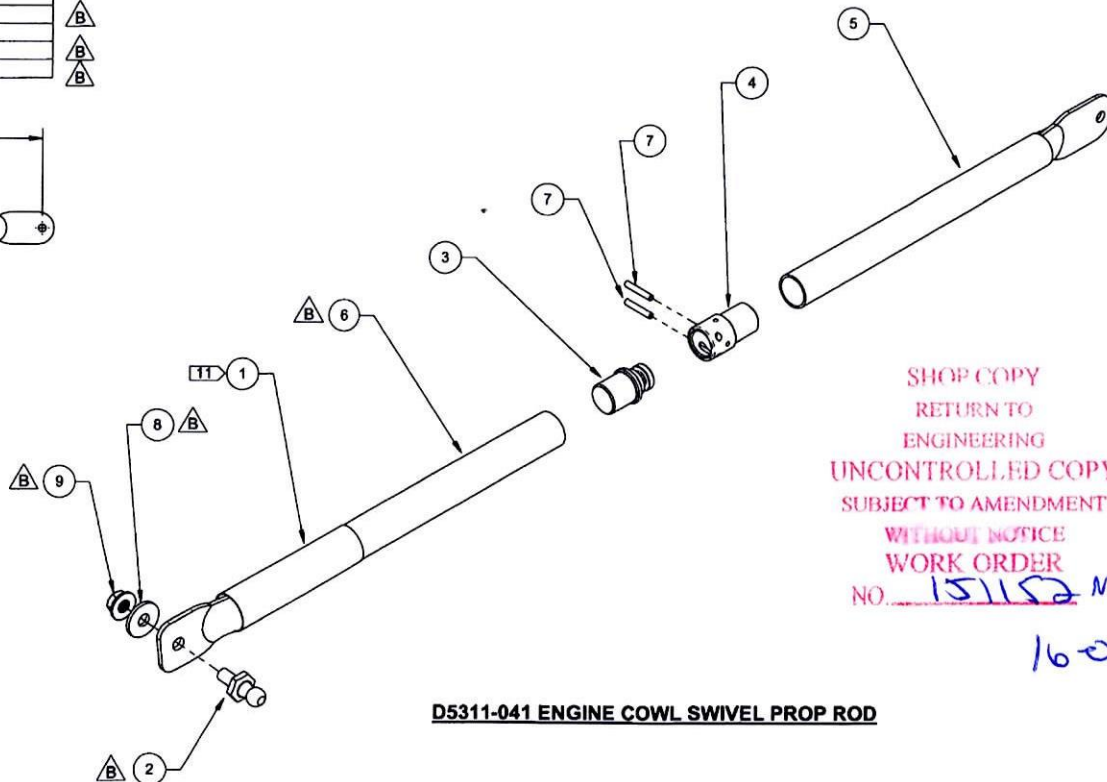
Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date : _____		Step #: _____		QTY Effective : _____			MRB (QSI042) Approval Completed By Lead hand / Supervisor Approval Verification QC / QA Coordinator Approval		
Description Work Order Deviation				Disposition					

Root Cause				FAULT CATEGORY			
Environment ☐	☐	No Re-verification ☐		Pressure/Forced ☐	☐	Temperature/Cure ☐	☐
Design ☐	☐	Operator ☐		Bending ☐	☐	Set-up ☐	☐
Doc/Data ☐	☐	Offset/Setup ☐		Centre Not Concentric ☐	☐	BOM/Route ☐	☐
Equip/Tooling ☐	☐	Supplier ☐		Cracks ☐	☐	Broken/Damage/Defect ☐	☐
Handling/Pre ☐	☐	Training ☐		Crimp/Kink/Ripple/Wave ☐	☐	Inspection Incomplete/Unqualified ☐	☐
Material ☐	☐	Use for Testing ☐		Cuffs ☐	☐	Contamination ☐	☐
Internal Transport ☐	☐	Poor Information ☐		Crushing ☐	☐	Countersink ☐	☐
Tribal Knowledge ☐	☐	Rushing ☐		Heat Treat ☐	☐	Cut Too Short ☐	☐
LOA ☐	☐	Product Improvement ☐		Wave/Twist in Tube ☐	☐	Instructions Incomplete/Unclear ☐	☐
Substation ☐	☐	Process Improvement ☐		Marks/Chatter ☐	☐	Drill Holes ☐	☐
Past Expiry Date ☐	☐	Manufacturing Process ☐		OTHER : _____			
Misidentified ☐	☐	Past Due ☐					

ITEM	QTY	P/N	DESCRIPTION
	X	D5311-041	ENGINE COWL SWIVEL PROP ROD ASSEMBLY
1	1	D3158-030	HEAT SHRINK TUBING
2	1	D3622-15	BALL STUD
3	1	D5311-1	SWIVEL JOINT
4	1	D5311-3	SWIVEL JOINT
5	1	D5311-5	PROP ROD
6	1	D5311-7	PROP ROD
7	2	D5317-1	DOWEL PIN
8	1	LN9016-06K	WASHER (ALT: LN9016-06L, 23111AG050LE)
9	1	LN9161-06M	NUT (ALT: ASN52320BH050N)



DETAIL A



SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 151152 MJS
16-09-14

D5311-041 ENGINE COWL SWIVEL PROP ROD

NOTES:

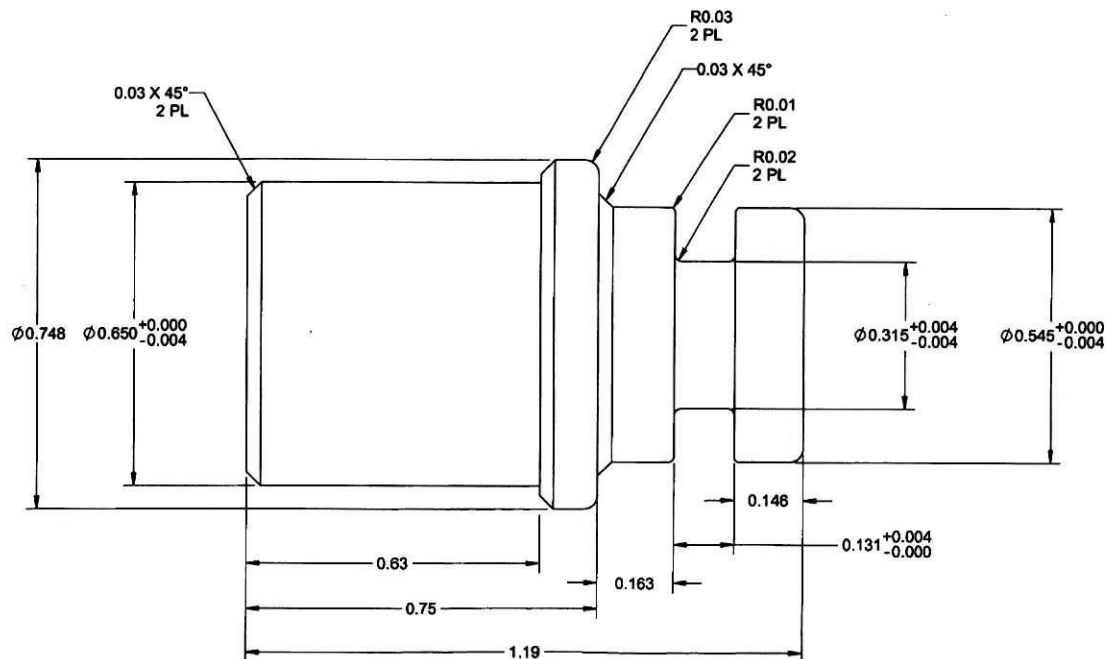
- 1) MATERIAL: N/A
- 2) FINISH: N/A
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: IDENTIFY PER QSI 044 6.1
- 7) WEIGHT: 0.91 lbs
- 8) WELD PER QSI 004
- 9) ENSURE ROD SWIVELS EASILY AFTER WELDING
- 10) REMOVE WELDING MARKS USING ELECTROPOLISHER
- 11) INSTALL APPROXIMATELY AS SHOWN

RELEASED
2016-04-18
EN 16-57

APPROVED

B	REVISED D5311-3 DIMENSIONS. ADDED D3622-15 BALL STUD, LN9161-06M NUT AND LN9016-06K WASHER. ADDED D5311-7 PROP ROD (SHEET 5).	AK	16.02.17
A	NEW ISSUE	AK	15.09.28
REV.	DESCRIPTION	BY	DATE
DESIGN	AK		
DRAWN	AK		
CHECKED	CC		
MFG. APPR.	DD		
APPROVED	HS		
DE APPR.	DS		
DATE	16.02.17		

DART AEROSPACE LTD
HAWKESBURY, ONTARIO, CANADA
DRAWING NO. **D5311**
REV. B
SHEET 1 OF 5
TITLE **ENGINE COWL SWIVEL PROP ROD NTS**
SCALE
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D5311-1 SWIVEL JOINT, INNER

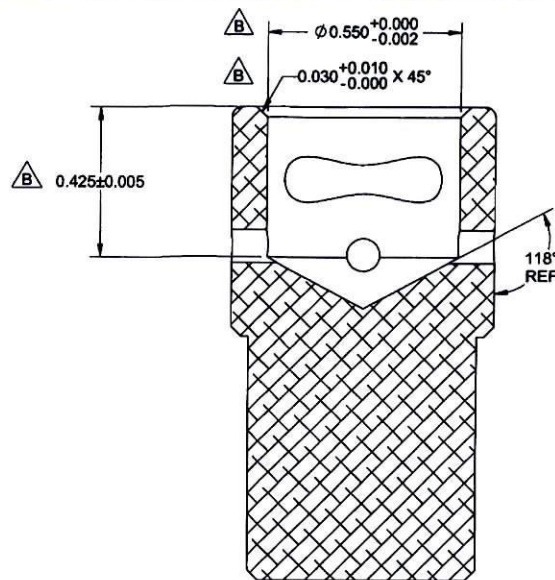
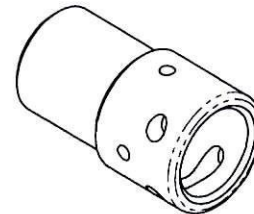
NOTES:

- 1) MATERIAL: AISI 304/316 SS ROUND BAR
PER ASTM A276
REF DART SPEC M304R
- 2) FINISH: N/A
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: N/A
- 7) WEIGHT: 0.10 lbs

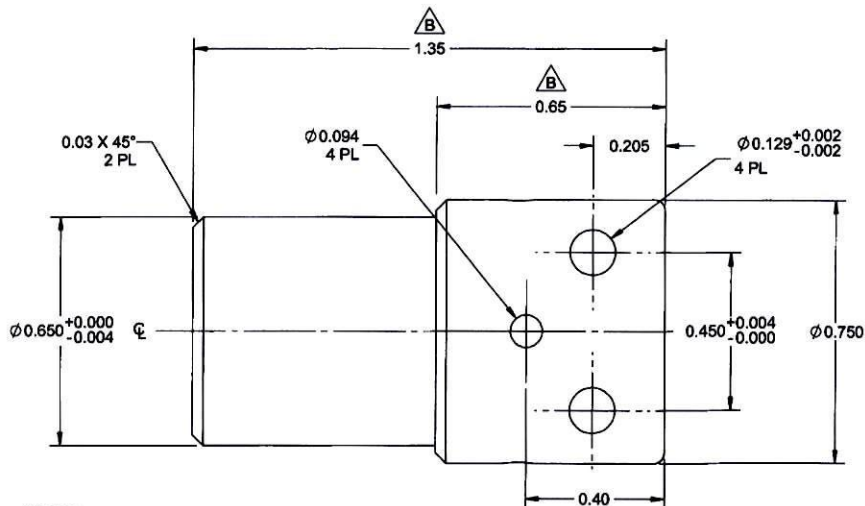
RELEASED
2016-04-18

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DESIGN	AK	DART AEROSPACE LTD	
DRAWN	AK	HAWKESBURY, ONTARIO, CANADA	
CHECKED	CC	DRAWING NO.	REV. B
MFG. APPR.	DD	D5311	SHEET 2 OF 5
APPROVED	HS	TITLE	SCALE
DE APPR.	DS	ENGINE COWL SWIVEL PROP ROD	NTS
DATE	16.02.17	COPYRIGHT © 2015 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	



SECTION A-A



NOTES:

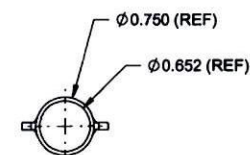
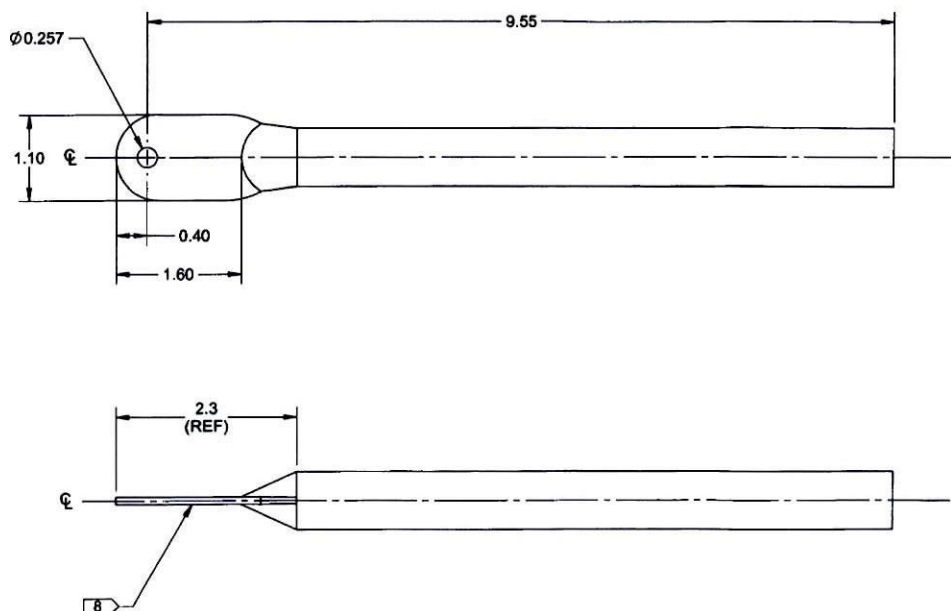
- 1) MATERIAL: AISI 304/316 SS ROUND BAR
PER ASTM A276
REF DART SPEC M304R
- 2) FINISH: N/A
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: N/A
- 7) WEIGHT: 0.11 lbs

D5311-3 SWIVEL JOINT, OUTER

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2016-04-18

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DESIGN	AK	DART AEROSPACE LTD	
DRAWN	AK	HAWKESBURY, ONTARIO, CANADA	
CHECKED	CC	DRAWING NO.	REV. B
MFG. APPR.	DD	D5311	SHEET 3 OF 5
APPROVED	HS	TITLE	SCALE
DE APPR.	DS	ENGINE COWL SWIVEL PROP ROD	NTS
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NOTES:

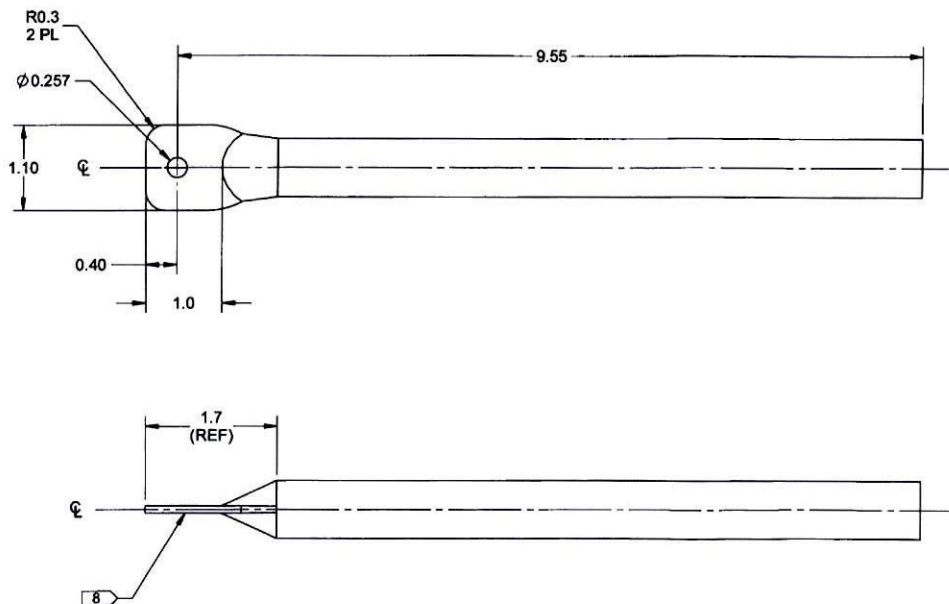
- NOTES:**
- 1) MATERIAL: AISI 304/316 SS SEAMLESS ROUND TUBING
PER ASTM A276 OR ASME SA213 OR ASTM A269
REF DART SPEC M304TR0.750W.049
 - 2) FINISH: N/A
 - 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
 - 4) UNITS: INCHES UNLESS OTHERWISE NOTED
 - 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
 - 6) IDENTIFICATION: N/A
 - 7) WEIGHT: 0.35 lbs
 - 8) PUNCH END USING TOOL NUMBER DT8117

RELEASED
2016-04-18

APPROVED

DESIGN	AK	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA DRAWING NO. D5311 TITLE ENGINE COWL SWIVEL PROP ROD	REV. B
DRAWN	AK		SHEET 4 OF 5 SCALE NTS
CHECKED	CC		
MFG. APPR.	HS		
APPROVED	HS		
DE APPR.	DS		
DATE 16.02.17		COPYRIGHT © 2015 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL. IT IS NOT TO BE REPRODUCED OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT IT IS NOT TO BE USED FOR ANY PURPOSE OR CONDUCTED TO ANY OTHER PERSON WITHOUT	

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D5311-7 PROP ROD

NOTES:

- 1) MATERIAL: AISI 304/316 SS SEAMLESS ROUND TUBING
PER ASTM A276 OR ASME SA213 OR ASTM A269
REF DART SPEC M304TR0.750W.049
- 2) FINISH: N/A
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: N/A
- 7) WEIGHT: 0.35 lbs
- 8) PUNCH END USING TOOL NUMBER DT8117. TRIM, DRILL NEW HOLE AND FORM CORNERS AS REQUIRED

RELEASED
2016-04-18

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DESIGN	AK	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA
DRAWN	AK	
CHECKED	CC	DRAWING NO. D5311
MFG. APPR.	DD	REV. B SHEET 5 OF 5
APPROVED	HS	SCALE
DE APPR.	DS	TITLE ENGINE COWL SWIVEL PROP ROD NTS
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